72. The method for converting fuel energy to electricity of claim 71, wherein at least one separation device is used for said dividing step, said at least one separation device being at least one selected from the group consisting of carbon fiber composite molecular sieves (CFCMS) and inorganic membranes.

73. The method for converting fuel energy to electricity of claim 71, wherein said fuel cells are solid oxide fuel cells.

74. The method for converting fuel energy to electricity of claim 71, further comprising the step of directing at least a portion of heat generated by said fuel cells for use in said converting step.

75. The method for converting fuel energy to electricity of claim 71, further comprising the step of generating heat using a nuclear reactor and directing at least a portion of said heat for use in said converting step.

76. The method for converting fuel energy to electricity of claim 75, wherein said converting step comprises a reforming step.

77. The method for converting fuel energy to electricity of claim 71, wherein said higher molecular weight gas is provided by a pipeline which provides pressurized natural gas, said mixed stream being directly provided to said turbine from a reactor provided for said

converting step without any additional steps for either compressing or heating said mixed gas stream.

78. The method for converting fuel energy to electricity of claim 71, further comprising the step of directing at least a portion of heat generated by said at least one fuel cell to a reformer provided for said converting step.

79. The method for converting fuel energy to electricity of claim 71, wherein said higher molecular weight gas comprises methane and said first lower molecular weight gas includes H_2 and said second gas includes CO.

80. The method for converting fuel energy to electricity of claim 71, wherein said fuel cells comprise solid oxide fuel cells.

81. The method for converting fuel energy to electricity of claim 71, wherein CO_2 is output by at least one of said fuel cells, wherein said CO_2 is used to produce additional energy.

82. The method for converting fuel energy to electricity of claim 81, wherein said additional energy is produced by said CO_2 driving a turbine.

83. The method for converting fuel energy to electricity of claim 81, wherein output streams from said fuel cells are supplied to a combustion chamber for oxidation of fuel which has not been fully oxidized.

84. The method for converting fuel energy to electricity of claim 71, wherein air is supplied to said fuel cells, said air first being supplied to a CO fuel cell and then to a H_2 fuel cell.

85. The method for converting fuel energy to electricity of claim 71, further comprising the step of supplying air to a device for providing oxygen enriched air prior to delivery to said fuel cells.

86. The method for converting fuel energy to electricity of claim 71, wherein said higher molecular weight gas is a hydrocarbon containing gas principally comprises methane.

87. The method for converting fuel energy to electricity of claim 86, wherein said hydrocarbon containing gas is supplied to a reformer at a pressure of at least approximately 40 atmospheres.

88. A system for converting fuel energy to electricity, comprising:

a reformer for converting a higher molecular weight gas into at least one mixed gas stream of lower average molecular weight comprising at least a first lower molecular weight gas and a second gas, said first and second gases being different gases;

at least one turbine to produce electricity from expansion of said mixed gas stream;

a separator for dividing said mixed gas stream into a first gas stream mainly comprising said first lower molecular weight gas and a second gas stream mainly comprising said second gas; and,

a first fuel cell for electrochemically oxidizing said first gas stream and a second fuel cell for oxidizing said second gas stream to produce electricity.

89. The system for converting fuel energy to electricity of claim 88, wherein said separator comprises at least one selected from the group consisting of carbon fiber composite molecular sieves (CFCMS) and inorganic membranes.

90. The system for converting fuel energy to electricity of claim 88, wherein said at fuel cells are both solid oxide fuel cells.

91. The system for converting fuel energy to electricity of claim 88, further comprising structure for directing at least a portion of heat generated by said fuel cells to said reformer.

92. The system for converting fuel energy to electricity of claim 88, further comprising a nuclear reactor for generating heat.

93. The system for converting fuel energy to electricity of claim 92, wherein at least a portion of said heat is directed to said reformer to heat said higher molecular weight gas.

94. The system for converting fuel energy to electricity of claim 88, wherein said higher molecular weight gas is provided by a pipeline which provides pressurized natural gas.

said mixed stream being directly provided to said turbine from said reformer without additional steps for either compressing or heating said mixed gas stream.

95. The system for converting fuel energy to electricity of claim 88, wherein said high molecular weight gas principally contains methane and is reformed by said reformer, wherein said first lower molecular weight gas comprises H_2 and said second gas comprises CO.

96. The system for converting fuel energy to electricity of claim 88, wherein said first and second fuel cells comprise solid oxide fuel cells.

97. The system for converting fuel energy to electricity of claim 88, wherein at least one of said first and second fuel cells produces a CO_2 output, wherein expansion of said CO_2 is used to produce additional energy.

98. The system for converting fuel energy to electricity of claim 88, further comprising a combustion chamber, wherein output streams from at least one of said fuel cells are supplied to said combustion chamber for oxidation of fuel which has not been fully oxidized.

99. The system for converting fuel energy to electricity of claim 88, wherein said first and second fuel cells comprise H_2 and CO fuel cells, respectively, and air is supplied to both said first and second fuel cells, said air first being supplied to said CO fuel cell and then to said H_2 fuel cell.

100. The system for converting fuel energy to electricity of claim 99, wherein said air is supplied to a device for providing oxygen enriched air prior to delivery to said fuel cells.

101. The system for converting fuel energy to electricity of claim 88, wherein said higher molecular weight gas is a hydrocarbon containing gas principally comprising methane.

102. The system for converting fuel energy to electricity of claim 101, wherein said hydrocarbon containing gas is natural gas, said natural gas supplied to said reformer at a pressure of at least approximately 40 atmospheres.